

Operative Outcomes between Fistulotomy and Ligation of Intersphincteric Fistula Tract for Fistula in Ano

Raihana Ahmed^{1*} Sayed Md Samser Nahid² Sreekanta Chandra Banik² Justin Clamp³
Md. Nur Hossain Bhuiyan⁴ Md. Anwarul Hoque⁵

Abstract

Background: Fistula in ano is a benign anorectal condition. Fistula can indeed be a challenging surgical condition for both patients and surgeons. It is very difficult to treat due to its high recurrence rate and anal incontinence. Ligation of the Intersphincteric Fistula Tract (LIFT) is a new surgical procedure to improve patient outcomes and reduce recovery time in the treatment of fistula in ano. The aim of the study to evaluate the success rate of LIFT procedure.

Materials and methods: This comparative study was carried out in the Department of Surgery of Chittagong Medical College Hospital (CMCH), Chattogram, during the period Nov 2019 to Nov 2020. A total of 40 patients with fistula in ano of both male and female above 18 years were included in this study. The fistulotomy patient was considered as group I and LIFT patient was considered as group II. Statistical analysis was obtained by using software like the Statistical Packages for Social Sciences (SPSS-version 22) on a windows computer.

Results: The mean VAS scoring of pain in group I was 2.5 ± 1.1 and in group II was 0.9 ± 1.4 at 6 months follow-up. Wound was healed in 15(75.0%) patients in group I and 20(100.0%) patients in group II at 6 months follow-up. The mean VAS scoring of pain, and wound healing differences were statistically significant ($p < 0.05$) between two groups in all follow-ups except wound healing, which was not statistically significant ($p > 0.05$) at 6 months follow-up. Incontinence and persistent symptom/LIFT failure were almost similar ($p > 0.05$) between two groups in all follow-ups.

Conclusion: The LIFT procedure provides the benefits of reducing post-operative pain, faster wound healing with no incidence of incontinence and low failure rate in

comparison with Fistulotomy. The LIFT procedure is simple, easy to learn and a good choice for the treatment of Fistula in Ano.

Key words: Fistula in Ano; Fistulotomy; LIFT procedure.

Introduction

Fistula in ano is a tract, lined by granulation tissue that connects deeply in the anal canal or rectum and superficially on the skin around the anus.¹ Fistulas are characterized based on their relationship with anal sphincter.² According to Parks classification, fistula can be classified by four types- inter-sphincteric, trans-sphincteric, supra-sphincteric, or extra-sphincteric.³ Surgery can indeed be an effective treatment for fistula in ano. Although the type of fistula may not be apparent from the external opening, the treatment depends on classification and assessment of the depth and involvement of the internal and external sphincter musculature. Surgical treatment of fistula in ano is to eradicate sepsis, promote healing, preserving the sphincter and mechanism of continence. Most of the patients with fistula in ano, fistula is treated by fistulotomy or fistulectomy or use of cutting seton. Now a days, various surgical treatment options are available for treatment of fistulas with varying success rates.

Management of fistula in ano remains surgical. The goal is to heal the fistulas in a short period of time, with lowest chance of recurrence and without disrupting the continence.⁴ Conventional fistulotomy is a commonly used procedure and most surgeons still rely on it as the gold standard for the treatment of perianal fistula.⁵ Recently, numbers of sphincter-preserving techniques have been developed with the common goal of minimizing the injury to the anal sphincter and maintenance of continence. LIFT was developed as a total sphincter preserving technique by Rojanasakul et al. from Bangkok, Thailand, in 2007, the authors reported success rate of 94.4% in 18 patients, with 0% rate of incontinence.⁶ This technique aims to identify the fistula tract within the intersphincteric plane. This procedure entails

1. ☐ Registrar of Casualty
☐ Chittagong Medical College Hospital, Chattogram.
2. ☐ Assistant Professor of Surgery
☐ Chittagong Medical College, Chattogram.
3. ☐ Radiologist
☐ Chittagong Medical College Hospital, Chattogram.
4. ☐ Professor of Surgery
☐ Dhaka Medical College, Dhaka.
5. ☐ Professor of Surgery
☐ Chattogram Maa-O-Shishu Hospital Medical College, Chattogram.

***Correspondence: Dr. Raihana Ahmed**

☐ Cell : 01911 75 47 17
☐ E-mail: dr. raihanaahmed@gmail.com

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dissection of intersphincteric space and subsequently ligated and divided to prevent the entry of fecal material into the fistula tract.³ LIFT procedure is an effective and sphincter saving technique for fistula in ano with shorter healing time and lower incidence of postoperative anal incontinence, as compared to fistulotomy.^{7,8} So, the aim of the study is to evaluate the success rate of LIFT procedure at a tertiary hospital by comparing it with fistulotomy in one year study period in terms of bleeding, sphincter injury, post-operative pain, wound healing, continence and persistent symptoms.

Materials and methods

This comparative study was done in the Department of Surgery in Chittagong Medical College Hospital (CMCH) Chattogram from November 2019 to November 2020. 40 patients were enrolled in this study. The Fistulotomy patients were considered as group I and LIFT patients were considered as group II. They were selected by consecutive sampling technique. Bowel preparation was done as per standard protocol. The research protocol was approved by the Institutional Review Board, CMCH, registration no: CMC/PG/2019/607 prior to the commencement of the study. Patient both male and female above 18 years of age with fistula were selected by the inclusion criteria. After greeting, the purpose of this study was explained. Both verbal and written informed consent was taken. The questions were in Bengali vernacular. Every study population had the right to withdraw from the study if they wish at any point. Respondent's name and relevant data were never disclosed to anybody but only used in academic purpose as anonymous. The privacy, confidentiality and respect to all study subjects were strictly honored. It did not involve any physical or mental injury to the respondents. All patients received preoperative bowel preparation with enema before the procedure. It was performed in the lithotomy position under regional anesthesia, with appropriate preoperative antibiotics. After confirming that there was no active sepsis or abscess, the fistula tract was delineated by using a probe, hydrogen peroxide injection or methylene blue injection. A probe was inserted through the external opening and gently passed through the tract to an internal opening. In

the case of fistulotomy the tract was then made open by cutting the skin, subcutaneous tissue and involved muscle. After exposing the tract that connects the internal and external opening of the tract remaining granulation tissue is curetted and cleaned with hydrogen peroxide and normal saline. In the case of LIFT procedure after identification of the tract, a fistula probe was introduced into the fistula tract. An incision was made directly over the intersphincteric groove to enter the intersphincteric space. After retracting the external sphincter, fistula tract was dissected, isolated, ligated close to internal and external anal sphincter and tract was then divided between them. Satisfactory closure was confirmed by injecting hydrogen peroxide from the external opening. The external opening was cleared by using a curette and/or cautery, and the opening was left open for drainage. The intersphincteric space was irrigated and closed with absorbable sutures in layer. Patients were discharged with instructions for 1 week of oral Ciprofloxacin and Metronidazole, NSAID with PPI, stool softener and sitz bath. Follow-up was scheduled for 1 week, 2 week, 6 weeks, 12 weeks, and 6 months after surgery. At each visit, patients were asked to report pain by using VAS scoring of pain, any discharge, any subjective change in continence to gas, liquid, or solid stool and persistence of symptom. Primary healing is defined as complete healing of both the external opening and intersphincteric incision with complete resolution of symptoms, without additional interventions. We classified LIFT failures into 3 types. Type I failures represented residual sinus tracts without an internal opening. Type II failures are presented as a downstage tract from the intersphincteric incision to the internal opening. Type III failures are complete failures that extend from previous internal opening to one or more external skin openings. This research protocol was approved by ERC of CMCH. A statistical analysis was carried out by using the Statistical Package for Social Sciences version 22.0 for Windows. The numerical data was expressed as mean with Standard Deviation (SD) and was compared using the students t-test. The categorical data was expressed as number and percentage and was compared using the chi-square

test and Fisher's Exact test. The result was presented in tables, figures and diagrams. A "p" value <0.05 was considered as significant.



Image 1 Ligation of the Intersphincteric Fistula Tract (LIFT)

Results

The mean age was 42.2 ± 16.8 years in group I and 41.3 ± 13.58 years in group II. Most (95.0%) of the patients were male in group I and 15(75.0%) in group II. Nearly one third (30.0%) of the patients were businessman in group I and 2(10.0%) in group II. All the patients had perianal pain and swelling in both groups. Most (90.0%) of the patients had single perianal discharging point-18(90.0%) in group I and 20(100.0%) in group II. Incontinence was found by one (5%) patient in each group. More than one third (35.0%) of the patients had constipation in group I and 5(25.0%) in group II. It was observed that 9(45.0%) patients had previous history of perianal operation in group I and 7(35.0%) in group II, respectively. Four (20.0%) patients were diabetic in group I and 2(10.0%) in group II. Hypertension was found by 5(25.0%) patients in each group. Smokers were observed 9(45.0%) and 11(55.0%) in group I and group II respectively. The differences were not statistically significant ($p > 0.05$) between two groups regarding demographic characteristics, history of presenting complaint and past illness.

During per rectal exam, it was found that 17(85.0%) patients had single external opening in group I and 20(100.0%) in group II, respectively. More than one third (35.0%) of the patients had external opening in 3-6 o'clock and 6-9 o'clock position in both groups. Most of patients (95.0%) had perianal discharge in group I and 19(95.0%) in group II, respectively. Nearly two thirds (65.0%) of the patients had purulent discharge in group I and 10(50.0%) in group II. The differences were not statistically significant ($p > 0.05$) between two groups.

Table I Distribution of the study patients by wound healing (n=40)

Wound healing	Group I (n=20)		Group II (n=20)		p value
	n	%	n	%	
7th POP					
Healed	0	0.0	3	15.0	
Not healed	6	30.0	14	70.0	0.001 ^s
Discharged	14	70.0	3	15.0	
2 weeks					
Healed	0	0.0	5	25.0	
Not healed	6	30.0	12	60.0	0.001 ^s
Discharged	14	70.0	3	15.0	
6 weeks					
Healed	5	25.0	14	70.0	
Not healed	3	15.0	5	25.0	0.001 ^s
Discharged	12	60.0	1	5.0	
12 weeks					
Healed	11	55.0	19	95.0	
Not healed	3	15.0	1	5.0	0.010 ^s
Discharged	6	30.0	0	0.0	
6 Months					
Healed	15	75.0	20	100.0	
Not healed	1	5.0	0	0.0	0.057 ^{ns}
Discharged	4	20.0	0	0.0	

s= significant, ns= not significant, p value reached from Chi-square test.

Group I= Fistulotomy, Group II= LIFT Procedure.

Regarding wound healing, the differences between two group were statistically significant ($p < 0.05$) in all follow-ups except at 6 months follow-up.

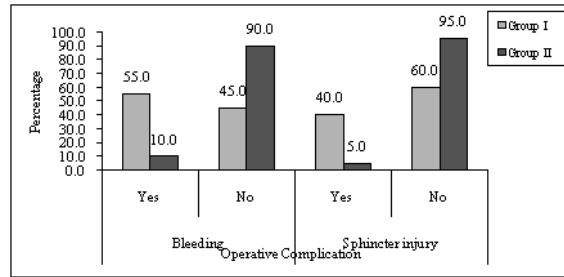


Figure 1 Bar diagram showing operative complication of the study patients

In operative complications, the differences between two groups were statistically significant ($p < 0.05$).

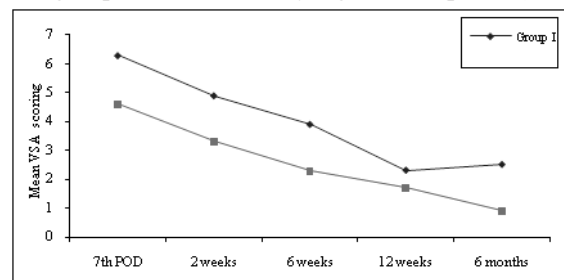


Figure 2 Line chart showing mean VAS scoring of the study patients

The mean VAS scoring of pain at 1 week was 6.3 ± 1.0 in group I and 4.6 ± 1.1 in group II. The mean VAS scoring of pain at 2 weeks was 4.9 ± 1.2 in group I and 3.3 ± 1.3 in group II. The mean VAS scoring of pain at 6 weeks was 3.9 ± 0.8 in group I and 2.3 ± 1.2 in group II. The mean VAS scoring of pain at 12 weeks was 3.5 ± 0.9 in group I and 1.7 ± 1.3 in group II. The mean VAS scoring of pain at 6 months was 2.5 ± 1.1 in group I and 0.9 ± 1.4 in group II. The differences were statistically significant ($p < 0.05$) between two groups.

Table II Distribution of the study patients by incontinence (n=40)

Incontinence	Group I (n=20)		Group II (n=20)		p value
	n	%	n	%	
7th POP					
Yes	15	75.0	0	0.0	0.001 ^s
No	5	25.0	20	100.0	
2 weeks					
Yes	4	20.0	0	0.0	^a 0.053 ^{ns}
No	16	80.0	20	100.0	
6 weeks					
Yes	3	15.0	0	0.0	^a 0.115 ^{ns}
No	17	85.0	20	100.0	
12 weeks					
Yes	2	10.0	0	0.0	^a 0.147 ^{ns}
No	18	90.0	20	100.0	
6 months					
Yes	2	10.0	0	0.0	^a 0.147 ^{ns}
No	18	90.0	20	100.0	

s= significant, ns= not significant, p value reached from Chi-square test, ^aFisher's exact test.

Regarding incontinence, the differences between two groups were statistically significant ($p < 0.05$) at 7 POD follow-up.

Table III Distribution of the study patients by Persistent symptom in group I and LIFT failure in group II (n=40)

Persistent symptom/ LIFT failure	Group I (n=20)		Group II (n=20)		p value
	n	%	n	%	
7th POP					
Yes	3	15.0	1	5.0	^a 0.292 ^{ns}
No	17	85.0	19	95.0	
2 weeks					
Yes	3	15.0	1	5.0	^a 0.292 ^{ns}
No	17	85.0	19	95.0	
6 weeks					
Yes	3	15.0	1	5.0	^a 0.292 ^{ns}
No	17	85.0	19	95.0	
12 weeks					
Yes	3	15.0	1	5.0	^a 0.292 ^{ns}
No	17	85.0	19	95.0	
6 months					
Yes	3	15.0	1	5.0	^a 0.292 ^{ns}
No	17	85.0	19	95.0	

ns= not significant, p value reached from Fisher's Exact test.

The differences between two groups were not statistically significant ($p > 0.05$).

Discussion

The goals in management of fistula-in-ano are to identify the internal opening, control of sepsis, definitive repair of fistula without recurrent disease and maintenance of continence. The LIFT technique is a novel approach through the intersphincteric plane for the treatment of fistula in ano. In this study, fistula in ano was more common in 4th and above decade in both groups, which was also reported by the earlier studies.^{8,9,10,11} In this study male is more commonly affected than female was also observed in previous studies.^{8,11,12} Personal hygiene and sedentary occupation were not statistically significant ($p > 0.05$) in patient with fistula in ano.¹³

Liu et al. obtained in their study that the signs and symptoms of an anal fistula include frequent anal abscesses, pain and swelling around the anus,

bloody or foul-smelling discharge (Pus) from an opening around the anus.¹⁴ The pain may decrease after drainage through external opening, irritation of the skin, pain with bowel movements, bleeding, fever, chills, and a general feeling of fatigue. The pain and swelling of previous study is similar to the present study.¹⁰

Wang et al. observed the likelihood of fistula presentation was greater in patients with a prior history of dermatosis and enteritis and those who had undergone previous non-fistula anorectal surgery.² Specific dietary associations for an increased fistula risk included regular ingestion of spicy and greasy foodstuffs, a history of diabetes and a high-salt diet, whereas lifestyle factors influencing fistula risk including sedentary habits and prolonged sitting on the toilets. Devaraj showed an association between smoking and fistula.¹⁵

Regarding the per rectal exam Laiwattanapaisal mentioned in their study that 31.3% had internal opening site of the LIFT group was at 6 o' clock position and the most frequent external opening site of the LIFT group was at 5 o' clock position, which is comparable to the present study.¹⁶ Discharge was the main complaint and it was present in all patients in previous study, which supports the present study.¹⁰

Regarding the operative complication in this current study bleeding was significantly ($p<0.05$) higher in group I. Similarly, Nirmala et al.¹⁷ showed more bleeding occurred in fistulotomy group than the LIFT group. Besides that, Elsebai et al.¹⁰ showed no bleeding occurred in any patient in ligation of intersphincteric fistula tract technique. This was owing to good hemostasis and use of diathermy during operations.

In this study, we also obtained that Ligation of Intersphincteric Fistula Tract (LIFT) procedure is a new effective sphincter-preserving technique and one of the main advantages of this technique is less or no chance of an impaired sphincter function (As there is no section of the sphincter). In this present study sphincter injury was significantly ($p<0.05$) higher in group I. Alapach and Khaimook observed 16.2% fistulotomy patients reported abnormal anal sphincter function, compared with 2.1% LIFT patients reported abnormal anal sphincter function, which is comparable to the current study.¹⁸

Ayyar observed that patients operated by LIFT procedure showed significantly decreased postoperative pain compared to patients underwent fistulotomy, which is similar to the present study.¹⁹ Similarly, Han et al. study observed that the VAS scoring of pain was rapidly increase on day 1 and a rapidly decrease on the following days, significant differences were noted between the two groups ($p<0.05$).¹¹ Less post-operative pain in LIFT group than fistulotomy group also observed in previous study.¹⁷

Regarding the wound healing Xu and Tang obtained in their study that multiple factors affected the healing rate of anal fistula, including complexity of the original fistula tract, manipulation of operative bed, comorbidities, the surgeon's proficiency with the procedure, previous operations, and other unidentified factors.⁸ In this study, we observed that wound healing significantly ($p<0.05$) higher in groups II in all follow-ups, except at 6 months follow-up. Ayyar also showed that patients operated by LIFT significantly ($p<0.05$) faster wound healing (5.74 vs 6.89 weeks).¹⁹ Laiwattanapaisal showed LIFT technique had 81.2% healing rate and estimated healing time was 4 - 6 weeks.¹⁶ Vinay & Balasubrahmanya and Yardimci et al. showed similar observation in their respective studies, which support with the present study.^{20,21}

About the incontinence it was found that 10-20% incontinence occurred in different follow-up in group I but there was no incidence of incontinence observed in any follow-up in group II, which is closely resembled with some previous studies.^{9,18,19,20,21} However, Alapach and Khaimook showed postoperative anal incontinence was 16.2% and 2.1% ($p<0.05$) for the fistulotomy and LIFT procedure respectively.^{18,16} LIFT procedure has the advantages of preservation of the anal sphincters, minimal tissue injury, short healing time with no additional costs. In case of failure, the procedure can be readily repeated.⁹ In another study Han et al. mentioned that the ideal surgical management to treat anal fistulas is to cure the disease without any risk of fecal incontinence.¹¹

This study showed that persistent symptom occurred in three cases in group I and LIFT failure was observed only one case in group II, however the differences were not statistically significant ($p>0.05$) between two groups. Laiwattanapaisa showed 9.4% recurrence rate in the fistulotomy group, but 18.3% type I failure rate was found in LIFT group, which was treated by debridement, curettage and antibiotics.¹⁶ The prevention of the entry of fecal material into the fistula tract and eliminated the formation of a septic nidus in the intersphincteric space.⁶ The correct choice of technique based on type and extension of fistula tract among the possible surgical procedures, is the most important for proper treatment of fistula and to reduce the risk of persistent symptom or incontinence which is obtained by this study.

Limitation

This study was performed in a selected population of surgery department of Chittagong Medical College Hospital for a period of one year. So that the results of this study may not reflect the exact picture of the country. The study was conducted in a very short period. This study was heterogeneous because there were patients with longstanding fistulas as well as previous procedures. Limited sample size was also a limitation of this study.

Conclusion

Patients operated by LIFT procedure showed significantly decreased operative complications compared to patients who underwent fistulotomy. All patients showed less per operative blood loss, less chance of sphincter injury, less postoperative pain, faster wound healing, no chance of incontinence and less chance of failure in LIFT procedure in comparison to Fistulotomy. The LIFT procedure for fistula in ano is simple, less invasive, with satisfactory outcomes in the short term. The LIFT procedure converts the fistula-in-ano from a difficult-to-manage problem into a much more tractable one. LIFT is a new effective sphincter-preserving technique. One of the main advantages of LIFT technique is the low possibility of an impaired sphincter function. Our results suggest that LIFT procedure is the technique of choice to minimize operative complications and could be a good alternative to fistulotomy in fistula in ano.

Recommendations

Further multi-center research works may be done in future with inclusion of larger sample size representing same socio-demographic profile to get the actual scenario of the country. It would be desirable to have a homogenous population undergoing conventional fistulotomy versus LIFT procedure for fistula in ano.

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Contribution of authors

RA-Conception, design, manuscript writing, acquisition, interpretation of data & final approval.

SMSN- Design, acquisition of data, data interpretation, critical revision & final approval.

SCB-Data interpretation, analysis, critical revision & final approval.

JC-Acquisition of data, drafting & final approval.

MNHB-Analysis, critical revision & final approval.

MAH-Analysis, critical revision & final approval.

Disclosure

All authors declared no conflicts of interest.

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